UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION
BERKELEY, CALIFORNIA

ELECTRIC PIG BROODERS

JAMES R. TAVERNETTI and E. H. HUGHES

BULLETIN 618

December, 1937

UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONTENTS

ELECTRIC PIG BROODERS[1, 2]

JAMES R. TAVERNETTI[3] AND E. H. HUGHES[4]

THE ELECTRIC PIG BROODER is a device used to reduce the loss of pigs during the first week or 10 days of their life. It provides a warm protected place for the pigs to lie when not nursing and thus reduces the danger of injury by the sow. Although the heat in the brooder is used mainly to attract the pigs, it is also beneficial during extreme cold weather in preventing the pigs from becoming chilled. In experiments conducted at the North Dakota Experiment Station,[5] 69.8 per cent of the pigs farrowed under usual conditions were raised, and 30.2 per cent lost. Of the number lost, 78 per cent died by accident or otherwise during the first 2 weeks after farrowing. At the North Platte (Nebraska) Branch Experiment Station,[6] records of 159 litters showed that only 60 and 76 per cent of the pigs farrowed were raised by mature and young sows, respectively.

In the fall of 1932 and the spring of 1933 several electric pig brooders were constructed and used at the Oregon Agricultural Experiment Station.[7] Because good results were reported, a manufacturer of rural electric equipment put a ready-made underheat type of pig brooder on the market.

To further determine the practicability of electric pig brooders, a series of trials were made during the spring farrowing seasons of 1935, 1936, and 1937 at the California Agricultural Experiment Station, and the results are reported in this bulletin.

CONSTRUCTION OF BROODERS

Two types of brooders were used in the trials: one, a radiant type of original design, in which the pigs received heat (fig. 1) from an overhead light; the other, an underheat type (fig. 2), in which pigs received heat by lying on a heated bed. The hovers for both types were the same—

[1] Received for publication October 18, 1937.

[2] This publication is the fourteenth of a series reporting results of investigations conducted by the California Agricultural Experiment Station in coöperation with the California Committee on the Relation of Electricity to Agriculture.

[3] Assistant Agricultural Engineer in the Experiment Station.

[4] Professor of Animal Husbandry and Animal Husbandman in the Experiment Station.

[5] Sevenson, Albert. Prolificacy of sows and mortality of pigs. Amer. Soc. Anim. Prod. Proc. 1927:60–62. 1927.

[6] Snyder, W. P. Pork production. Nebraska Agr. Exp. Sta. Bul. 147:1–31. 1915.

[7] Oliver, R. W., C. J. Hurd, and F. E. Price. The development of an electric brooder for baby pigs. Oregon Committee on the Relation of Electricity to Agriculture Prog. Rept. 24:1–7. (Mimeo.) June, 1933.

triangular in shape and constructed of wood with enclosed sides and top. The sides were 3 to 3½ feet long and 12 inches high. A piece of 2 × 4 inch lumber across the top of the front left an opening about 8 inches high for the entrance.

In the radiant brooder a reflector containing an ordinary electric light was placed over a hole in the center of the top of the hover. The reflectors

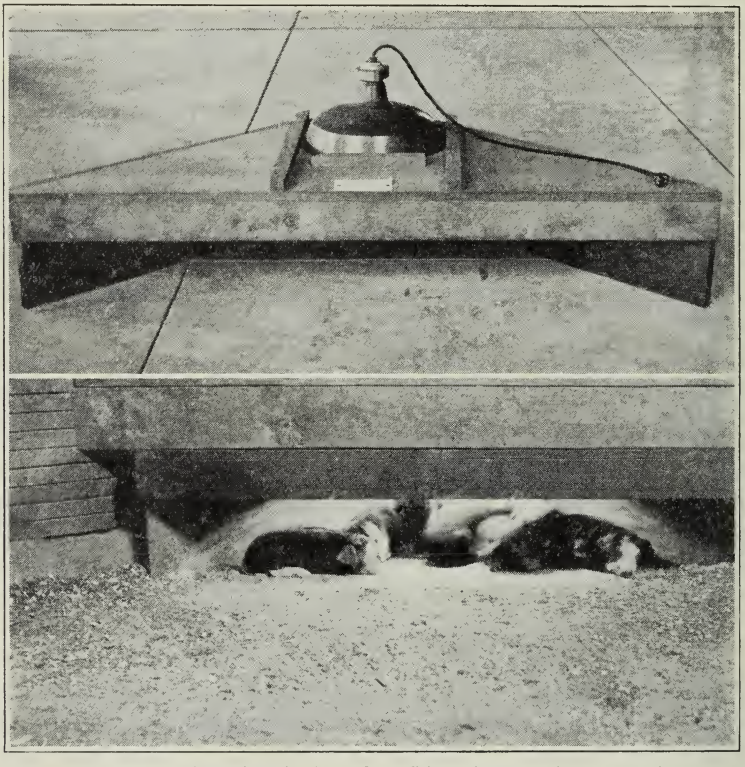

Fig. 1.—Radiant electric pig brooder. The pigs receive heat from an electric light in a reflector over a hole in the top of the hover.

varied in size from 12 to 15 inches, and the hole was made ½ inch smaller in diameter than the base of the reflector. Two types of reflectors were used: one a standard R. L. M. dome with white-enameled interior, and the other a homemade cone of sheet tin. Both 100- and 150-watt lights were used, for comparison. A piece of 1-inch-mesh wire netting was tacked on the underside of the hole to prevent the pigs from contacting the light or reflector.

In the underheat brooder a heating unit specially made for the purpose was placed on the floor. It consisted of an enclosed galvanized-iron box 2 feet square and 2 inches high mounted on ½-inch legs and contain-

ing open heating coils. The wiring to the heating coils was protected by a piece of conduit fastened to the box and extending up through the top of the hover. The heating element had a connected load of 100 watts.

METHOD OF CONDUCTING THE TRIALS

The brooders were placed in corners of the regular farrowing pens in the hog barn. They were securely fastened in place, and a barrier about

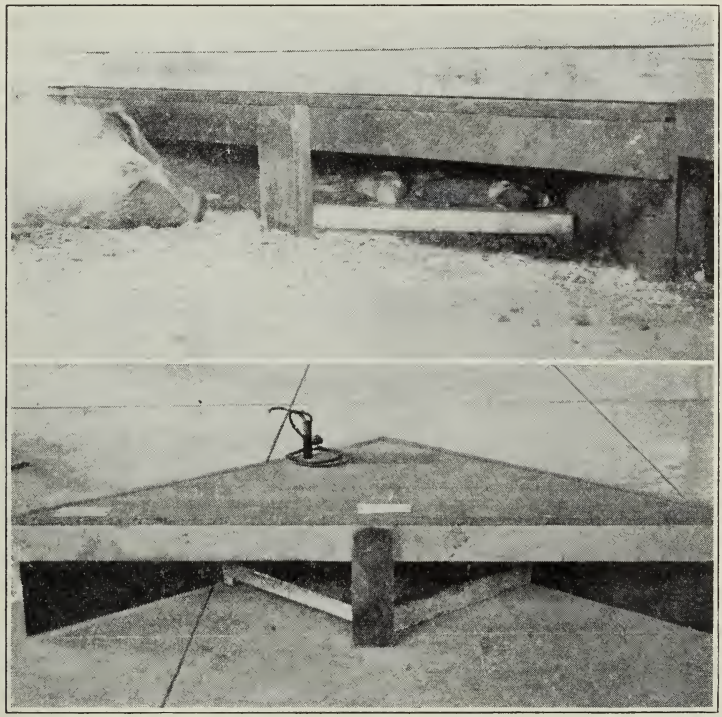

Fig. 2.—Underheat electric pig brooder. The pigs receive heat by lying on the metal pan enclosing the heating elements.

2 feet high was placed over the front to prevent the sows from getting on top of the hover.

The sows were placed in the pens a day or so before farrowing, and the heat was turned on in the brooders several hours before parturition. The pigs, after birth, were placed in the brooders by hand until they learned to go in voluntarily. The sows and pigs were left in the pens for 10 days, during which the heat in the brooders was on continuously.

Trials in 1935.—For the trials in the spring of 1935, three brooders were used : two of the underheat type and one of the radiant type having a 12-inch R. L. M. dome reflector and a 100-watt light. Checks for these were run in two other pens containing hovers similar to those used for

the brooders, but not heated; and one of the regular farrowing pens was equipped with guard rails. Except for three litters, farrowed in January and February, all the trials were made during March.

Trials in 1936.—For the trials in the spring of 1936, four brooders were used: two of the underheat type and two of the radiant type. Both the radiant brooders were equipped with R. L. M. dome reflectors and

TABLE 1

RESULTS OF TRIALS WITH ELECTRIC PIG BROODERS DURING SPRING FARROWING AT DAVIS

Type of equipment	Year conducted	Number of litters	Number of pigs farrowed*	Number of pigs lost†	Per cent lost
Radiant brooders	1935	2	14	2	14
	1936	5	35	4	11
	1937	6	48	7	15
	Total	13	97	13	13
Underheat brooders	1935	8	65	13	20
	1936	5	35	4	11
	1937	6	46	5	11
	Total	19	146	22	15
Regular farrowing pens	1935	3	24	13	54
	1936	10	71	13	18
	1937	11	88	28	32
	Total	24	183	54	29
Hovers without heat	1935	3	23	15	65

* Does not include pigs dead at birth.
† Includes pigs killed or dying of natural causes up to 10 days of age.

150-watt lights, but one reflector was a 12-inch and the other a 15-inch. Checks were run in several of the regular farrowing pens equipped with guard rails. All the pigs were farrowed in March.

Trials in 1937.—For the trials in the spring of 1937, four brooders were used: two of the underheat type and two of the radiant. Both the radiant brooders were equipped with 12-inch reflectors and 150-watt lights, but one reflector was a R. L. M. dome type and the other a homemade cone of tin. Checks were run in the regular farrowing pens equipped with guard rails. All the pigs were farrowed in March.

RESULTS

The results obtained for the three-year trials are given in table 1. In all three years the percentage of pigs lost was less in the pens with the brooders than in the regular farrowing pens. The loss for the three years with the brooders was approximately half of that in the regular farrowing pens.

Approximately 75 per cent of the pigs lost were killed or died during the first 2 days after birth. This was true both in the pens containing brooders and in the regular farrowing pens.

The time required to teach the pigs to go into the brooders varied with different litters. In some cases placing them in the brooder once or twice was sufficient, while in other cases it took a day or more for them to learn to go in. Holding the pigs in the brooders for several hours immediately after birth, by blocking the entrance, helped in getting them to go in voluntarily.

The pigs would not go into or stay in the hovers that were without heat, regardless of the number of times they were placed in them.

There was practically no difference between the results obtained with the underheat brooders and with the radiant brooders. Some trouble was experienced with the metal brooder's becoming too warm and causing the pigs to move around after lying on it for a short time. The radiant brooder had several other advantages. It was simpler, less expensive, and easier to construct; the light attracted the pigs and illuminated the pen; there was less danger from electrical shock; and the amount of heat could be varied by merely changing the size of the light globes.

Both the 100- and the 150-watt lights were satisfactory for the radiant brooders. The 150-watt, however, seemed more desirable, particularly during the first few days after farrowing.

Since some sows had a tendency to chew on the hovers, it was necessary to fasten the latter securely in place to keep them from being moved. Some trouble was experienced with the large sows lying across the front of the brooders and blocking the entrance.

COSTS

Initial Cost.—The initial cost of the underheat brooders was approximately $10.00 each, not including the labor for constructing; the ready-made heating unit cost $9.00 and the lumber for the hover about $1.00.

The initial cost of the radiant-type brooders was less than $5.00 each, including the hover, the reflector, and the light, but not the labor for constructing.

Operating Costs.—The electrical-energy consumption for the underheat brooders was approximately 2½ kilowatts per day or 25 kilowatts for the 10-day brooding period. The energy consumption with radiant brooders was the same as with the underheat when the 100-watt light was used and 50 per cent greater with the 150-watt light. Assuming an average cost of 2 cents per kilowatt-hour for electricity, the operating cost for 10 days' continuous operation was 50 cents with the 100-watt connected load and 75 cents with the 150-watt.

SUMMARY

Electric pig-brooders were successful in reducing the loss of pigs during the first 10 days after birth. In three years' trials the loss was reduced about 50 per cent.

Practically no difference in results was obtained with the two types of brooders used—namely, underheat and radiant. The radiant brooder had certain advantages in cost and operation over the underheat.

The initial and operating costs of the brooders was low enough to make their use economically feasible.

13*m*-12,'37(1046)